

FIG. 1

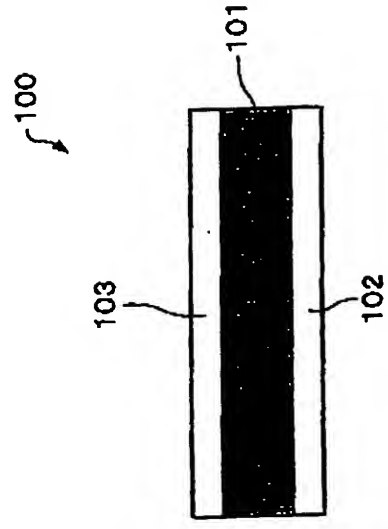


FIG. 2

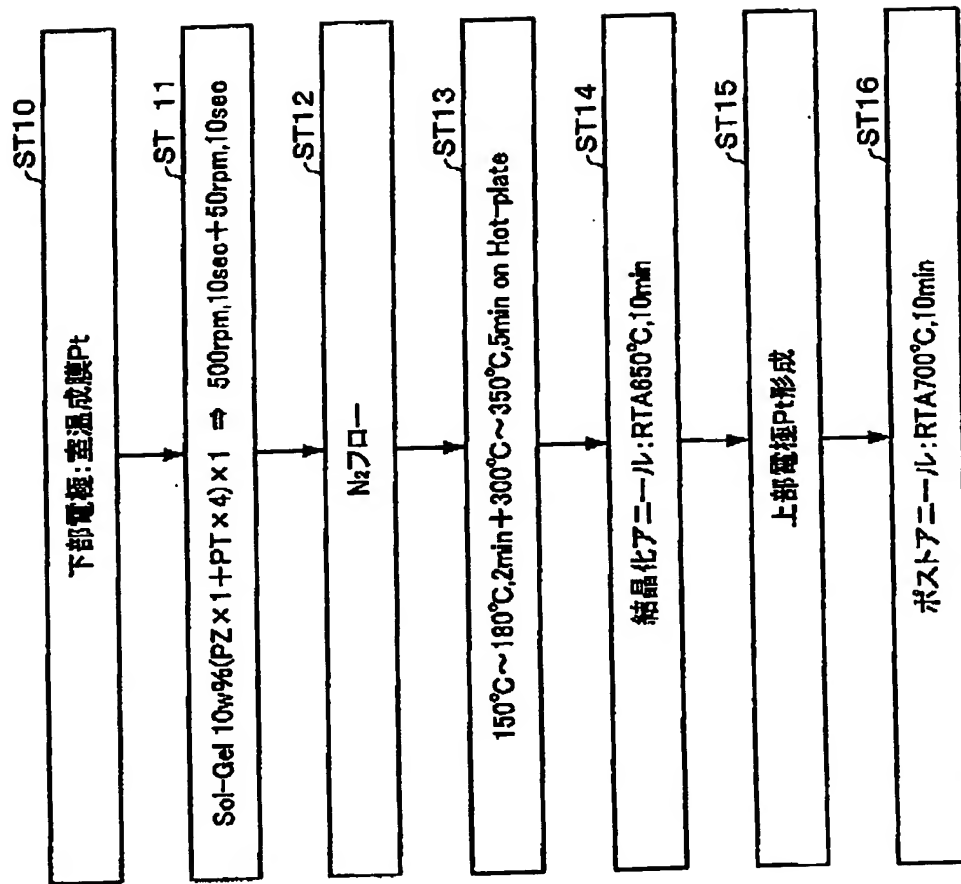


FIG. 3

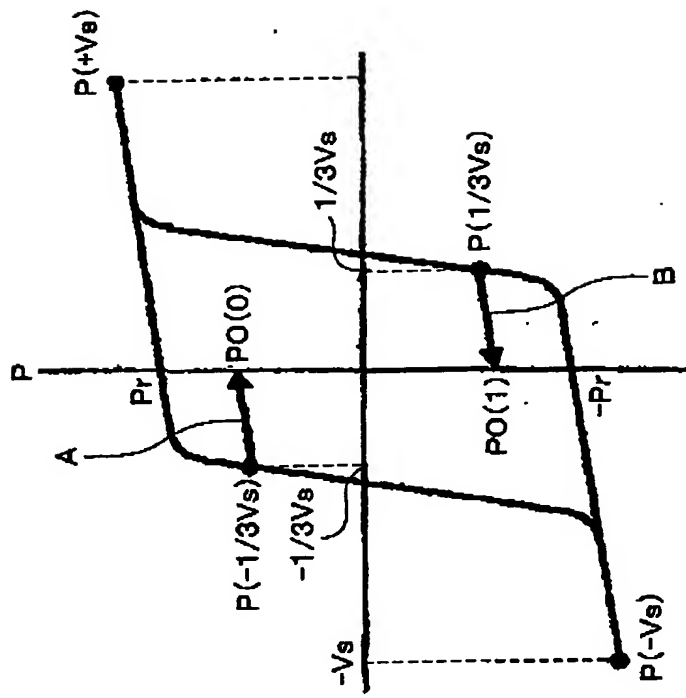


FIG. 4A

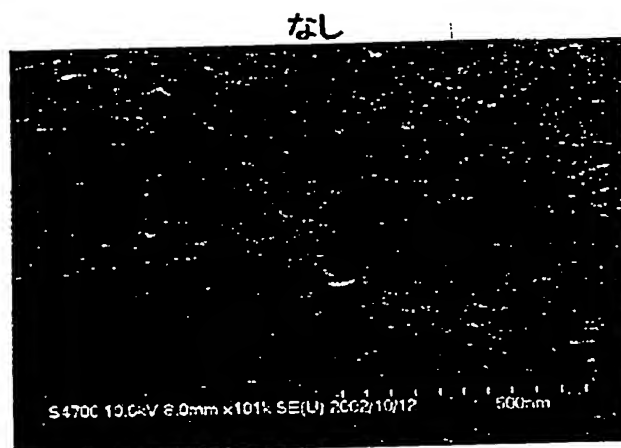


FIG. 4B

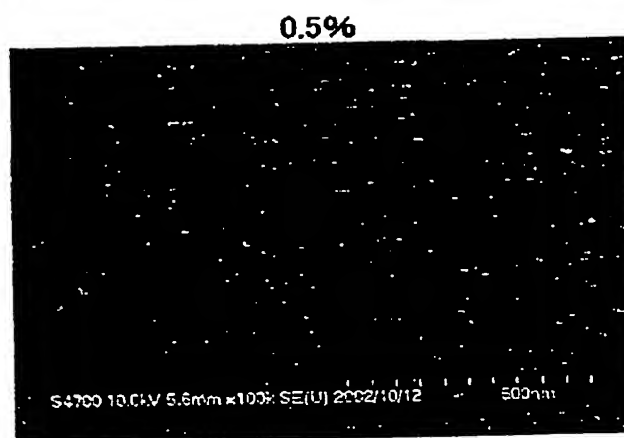


FIG. 4C

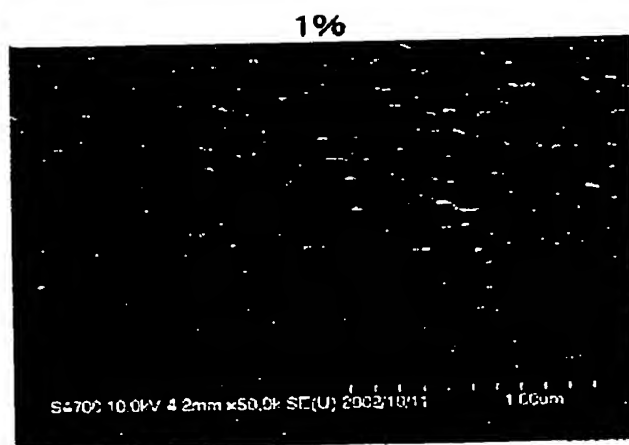


FIG. 5A

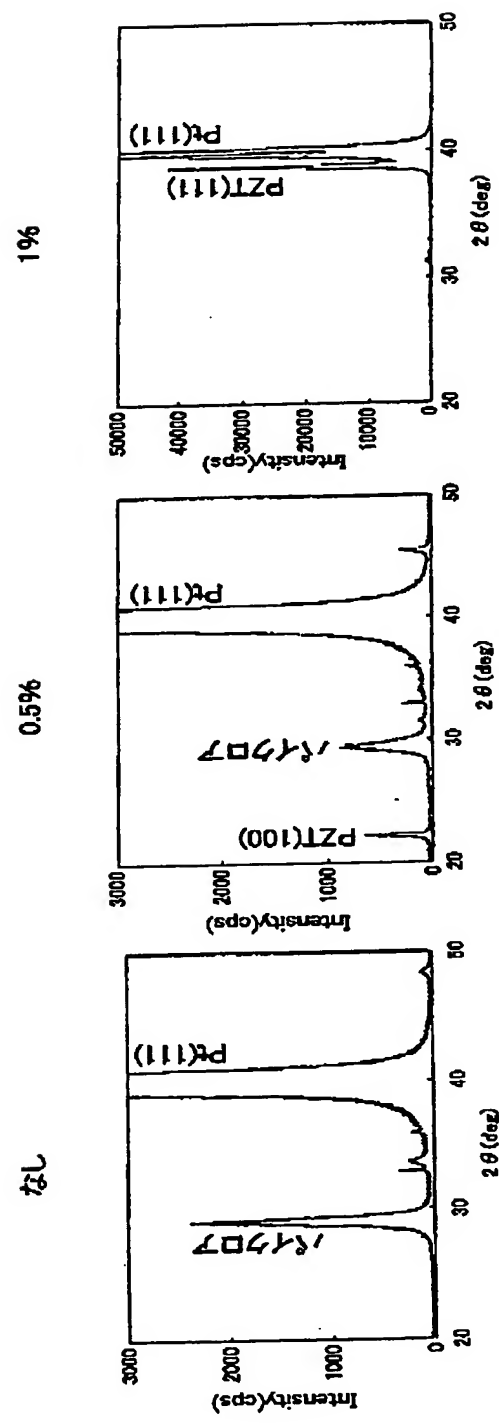


FIG. 5B

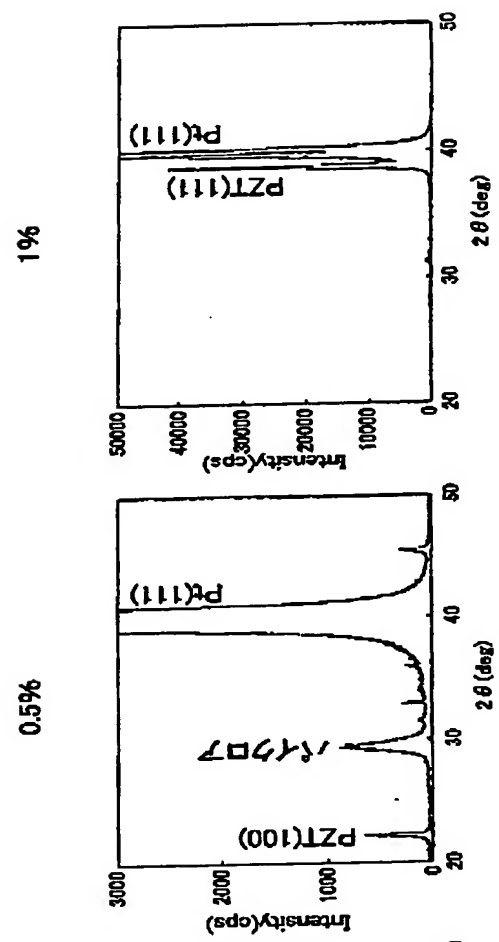


FIG. 5C

FIG. 6A

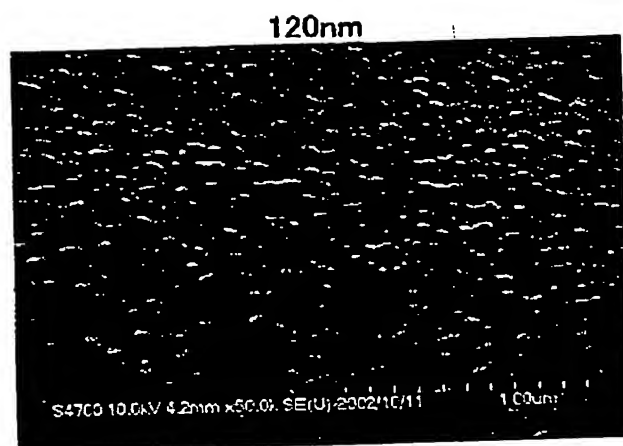


FIG. 6B

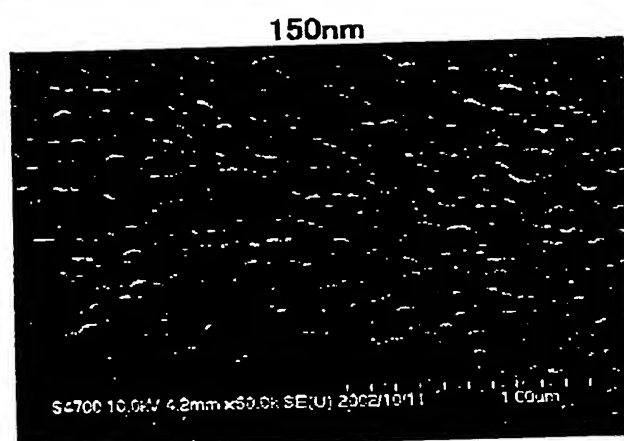


FIG. 6C

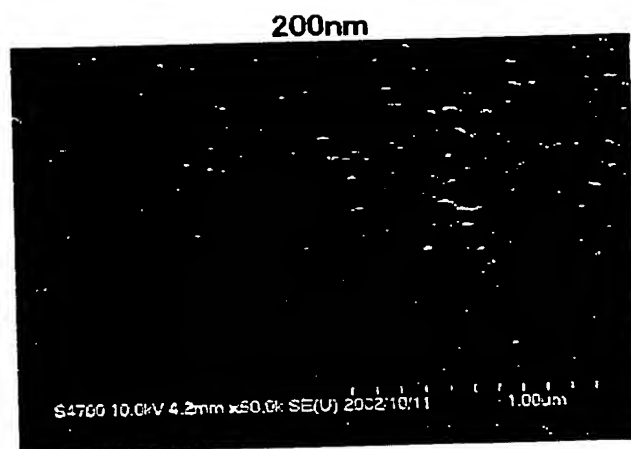


FIG. 7A

120nm

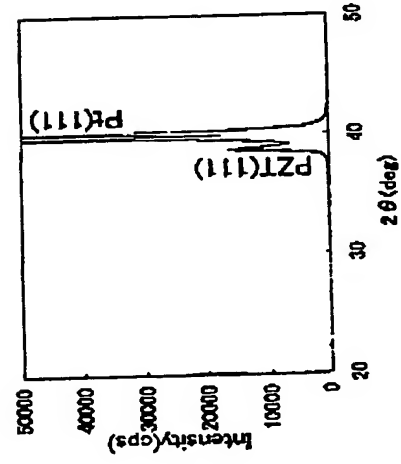


FIG. 7B

150nm

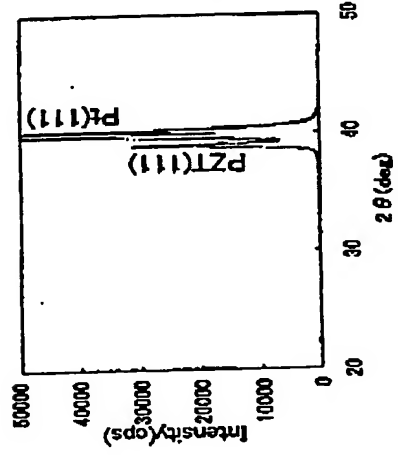


FIG. 7C

200nm

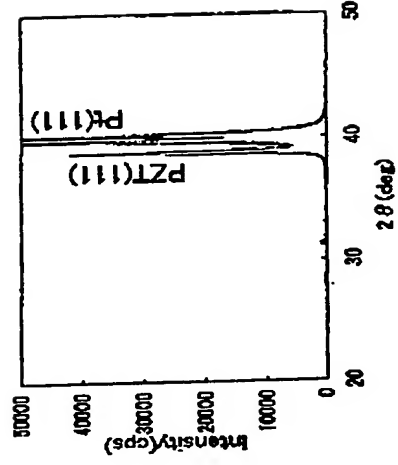


FIG. 8A

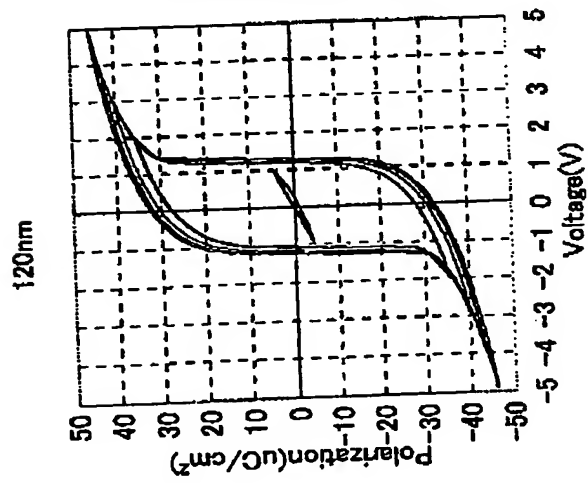


FIG. 8B

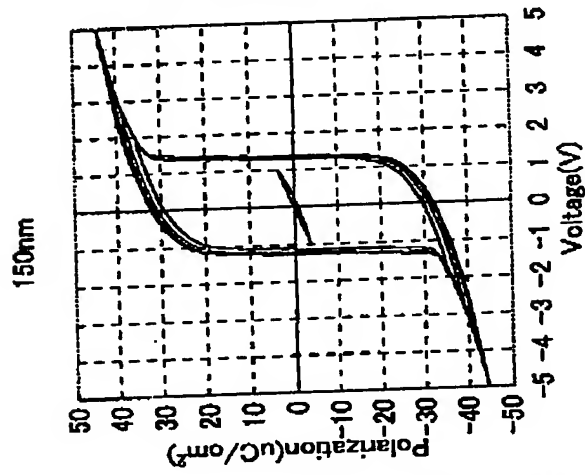


FIG. 8C

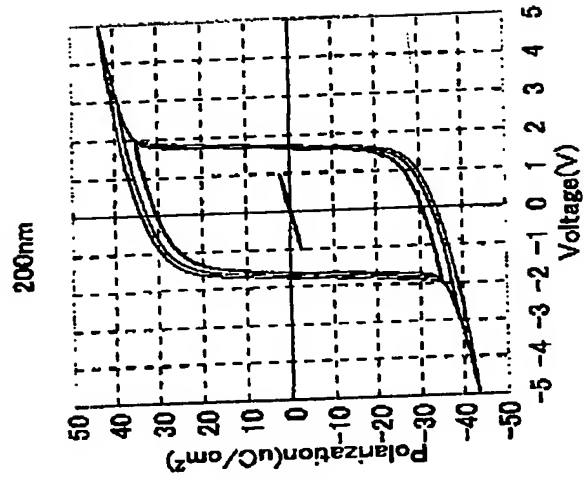


FIG. 9A

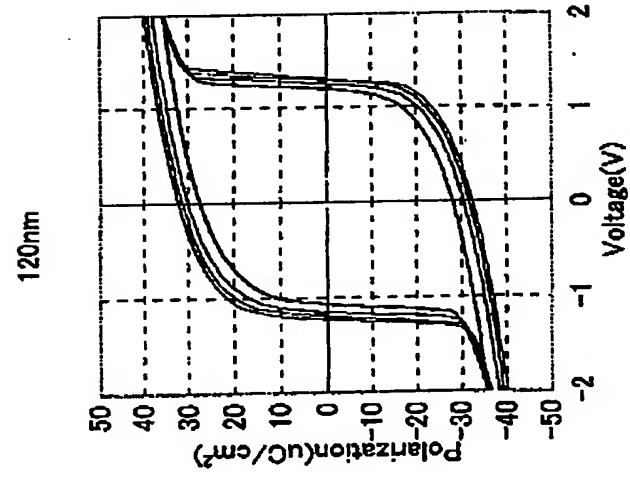


FIG. 9B

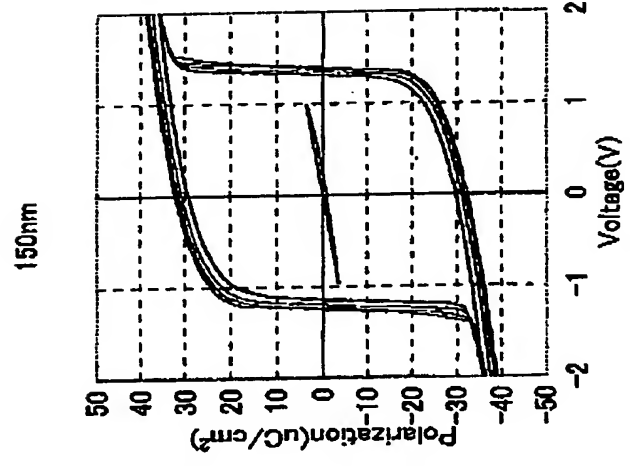


FIG. 9C

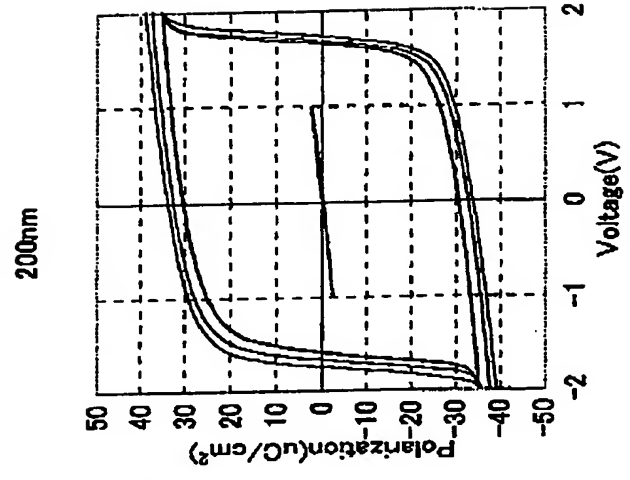


FIG. 10A

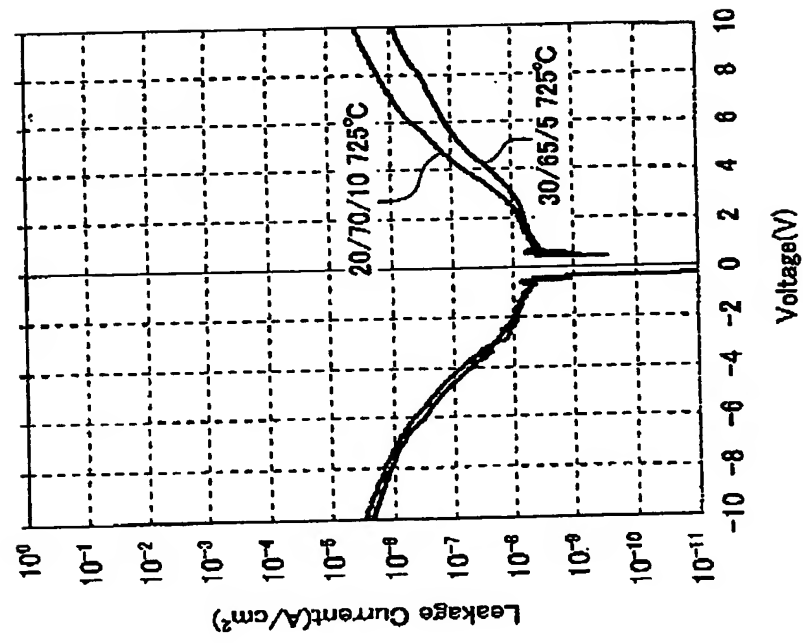


FIG. 10B

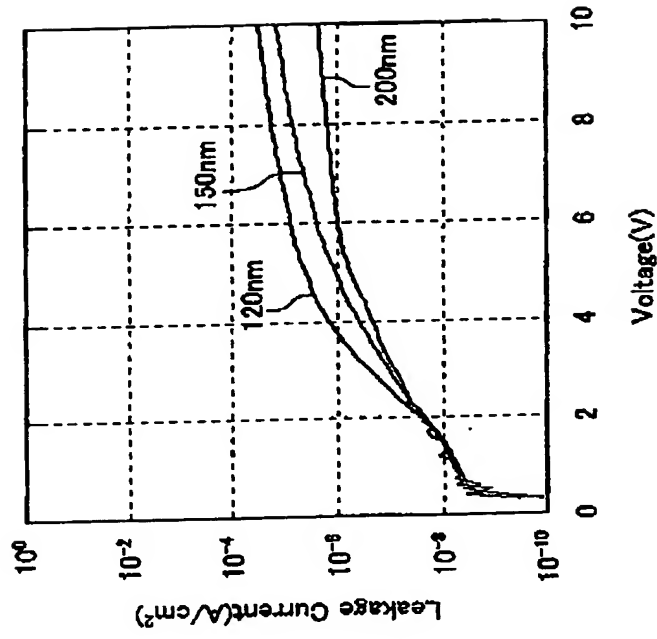


FIG. 11A

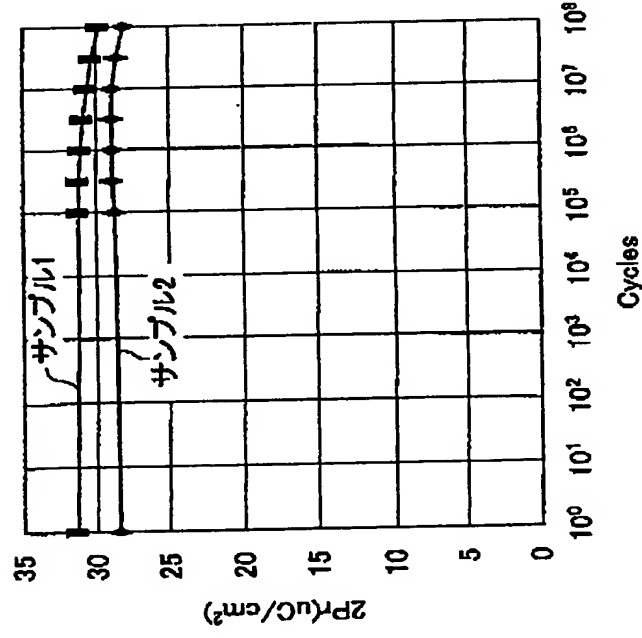


FIG. 11B

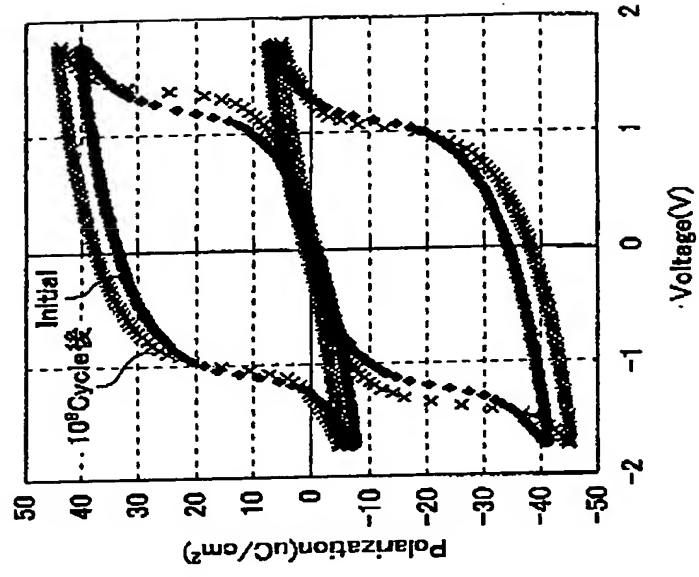


FIG. 12

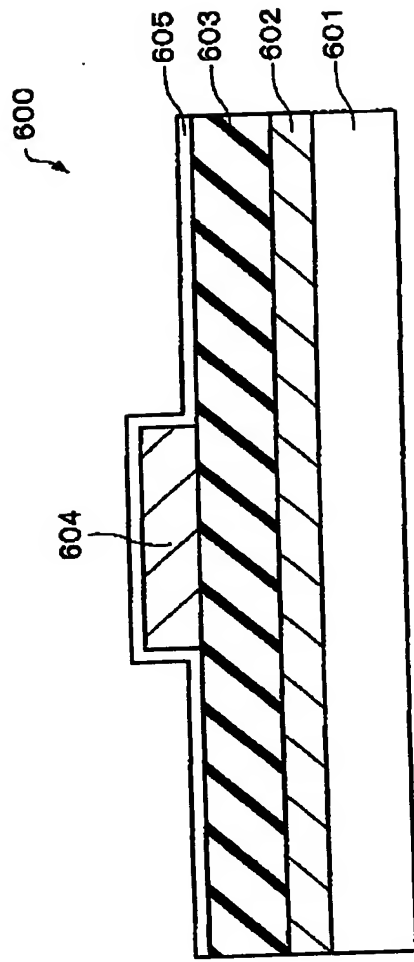


FIG. 13

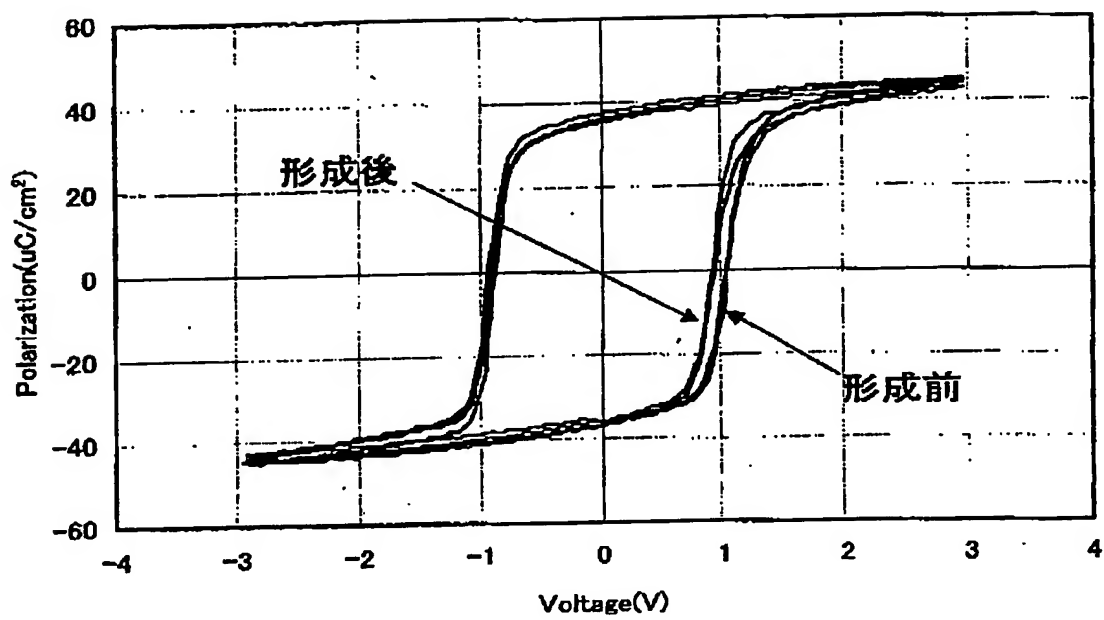


FIG. 14

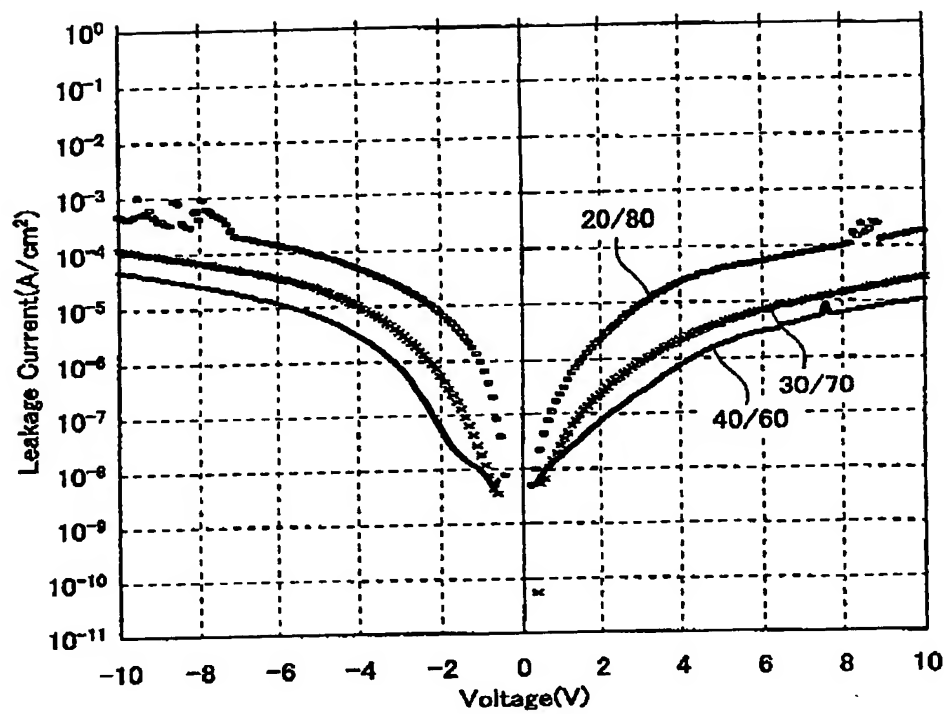


FIG. 15

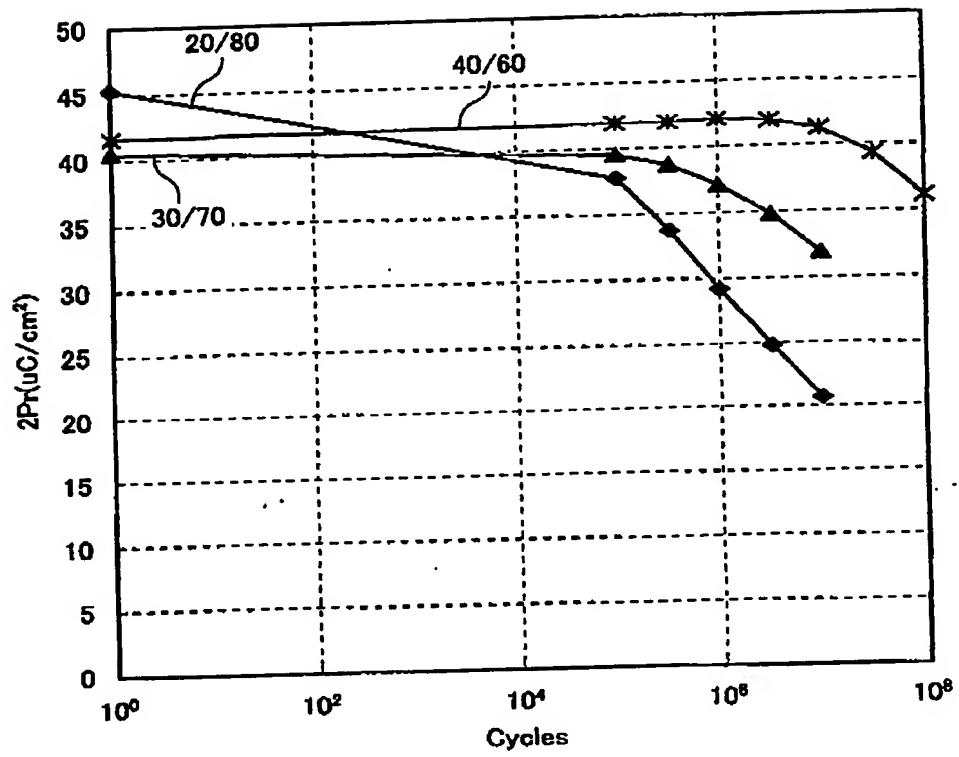


FIG. 16

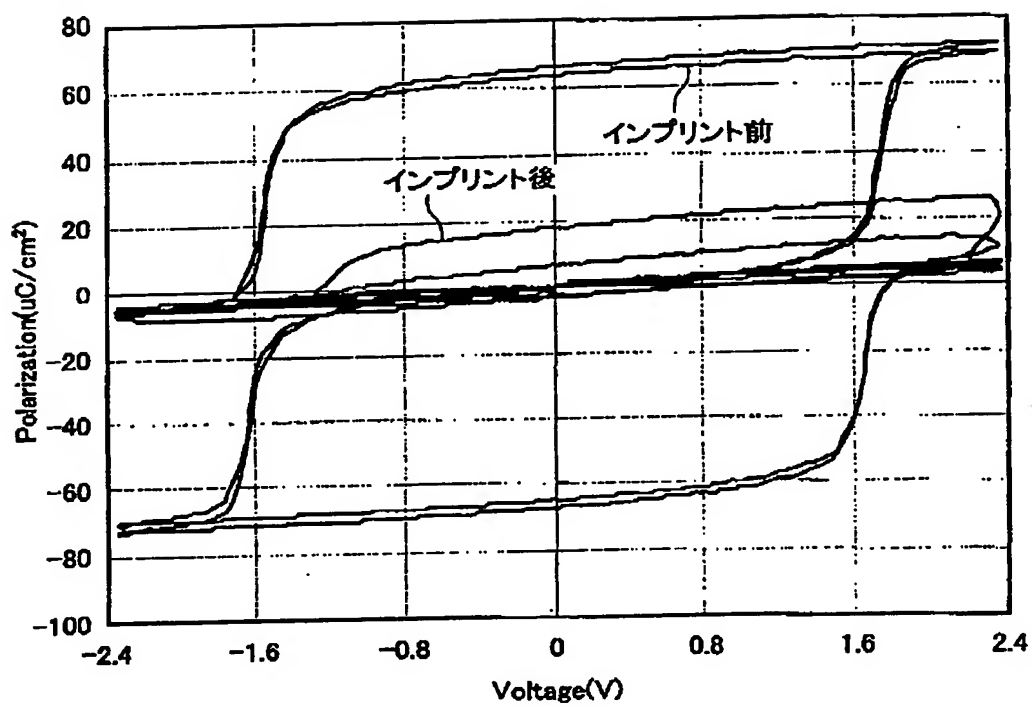


FIG. 17A

Nb=0 [mol%]

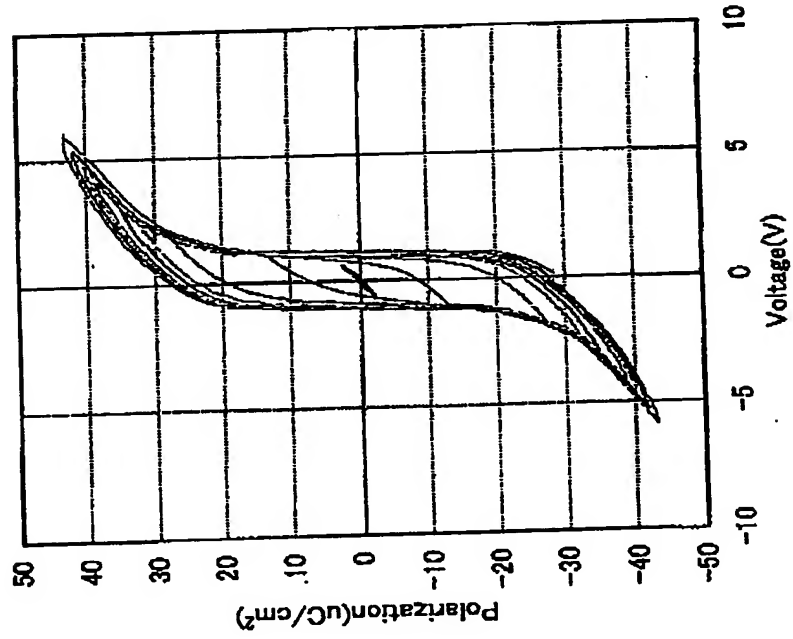


FIG. 17B

Nb=5 [mol%]

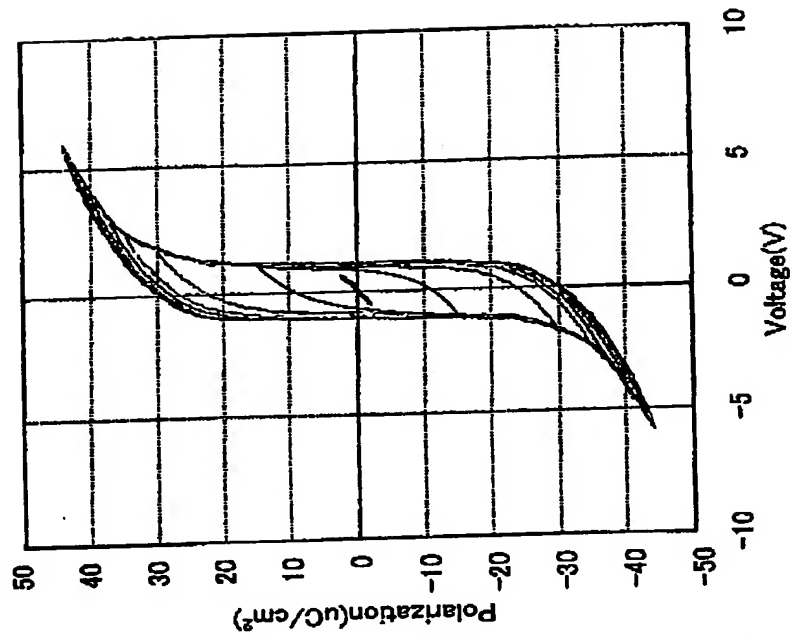


FIG. 18A

Nb=10 [mol%]

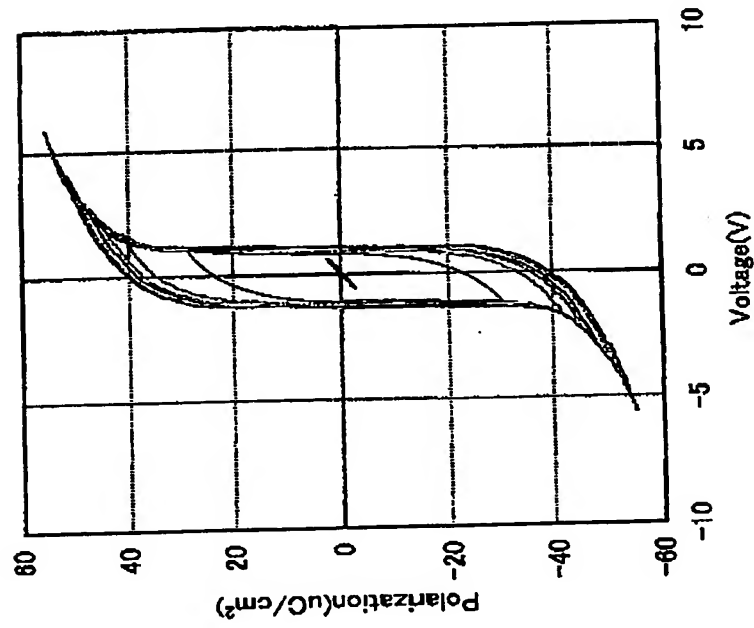


FIG. 18B

Nb=20 [mol%]

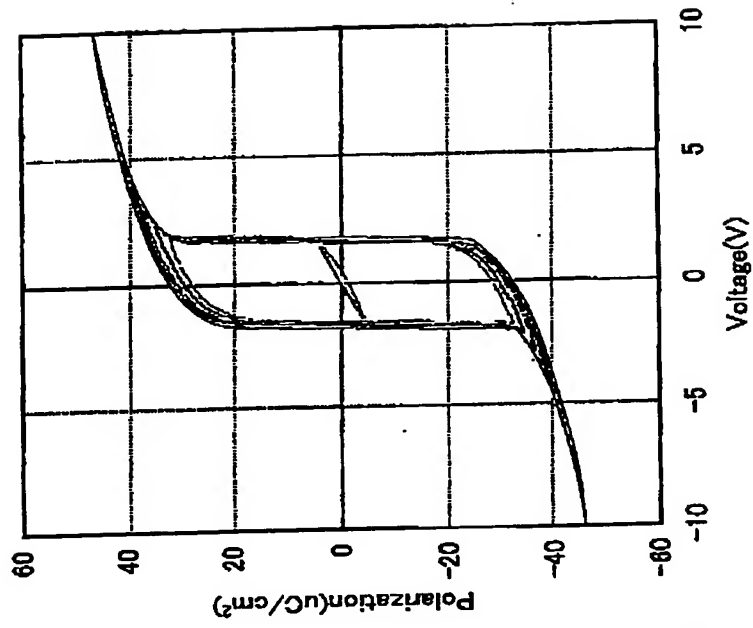


FIG. 19A

Nb=30 [mol%]

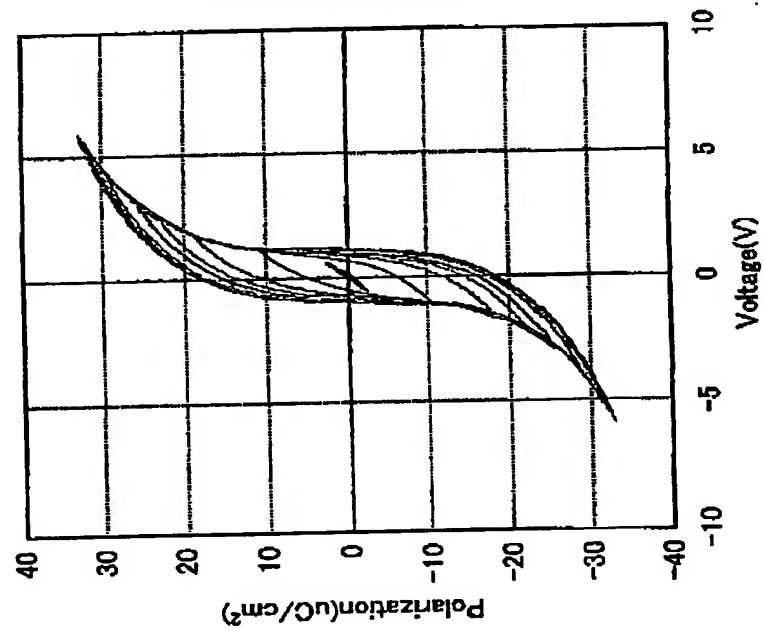


FIG. 19B

Nb=40 [mol%]

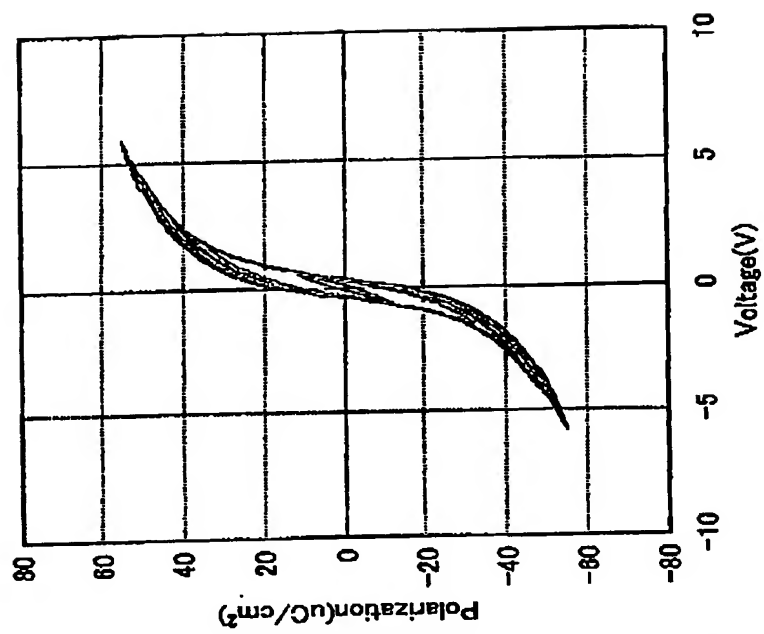


FIG. 20

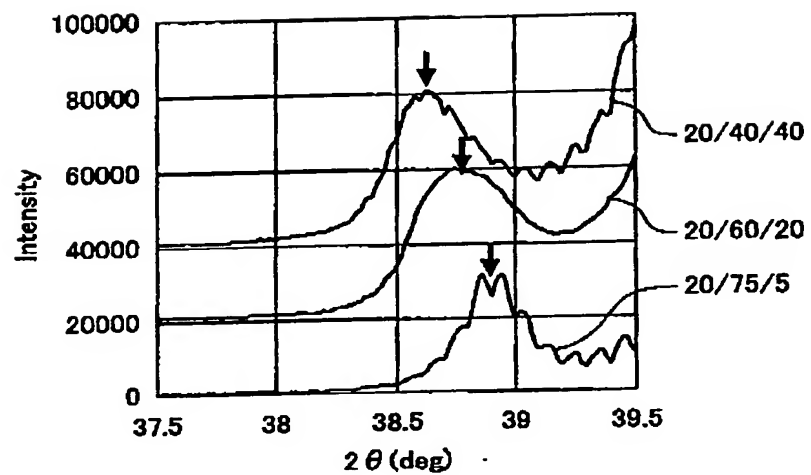


FIG. 21

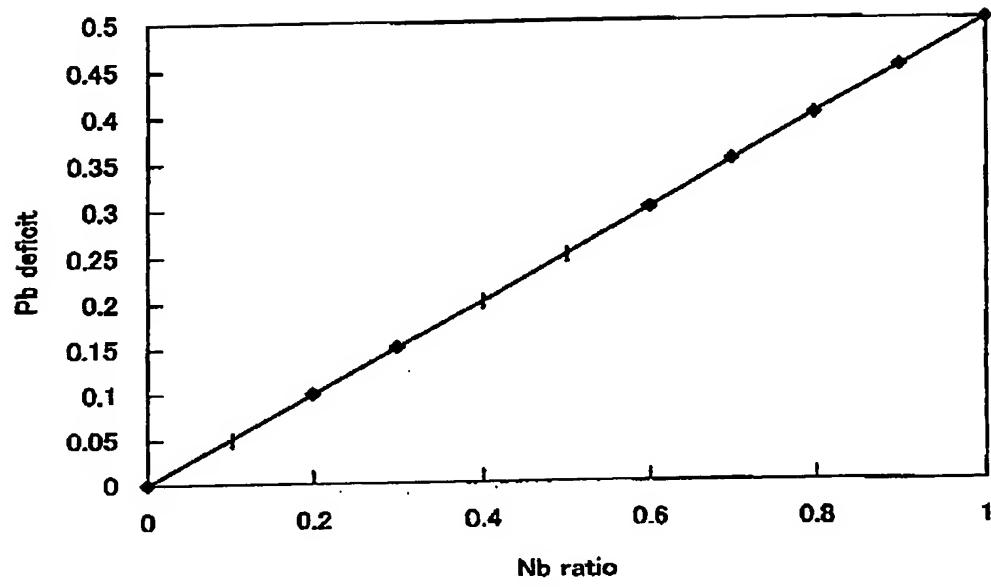


FIG. 22

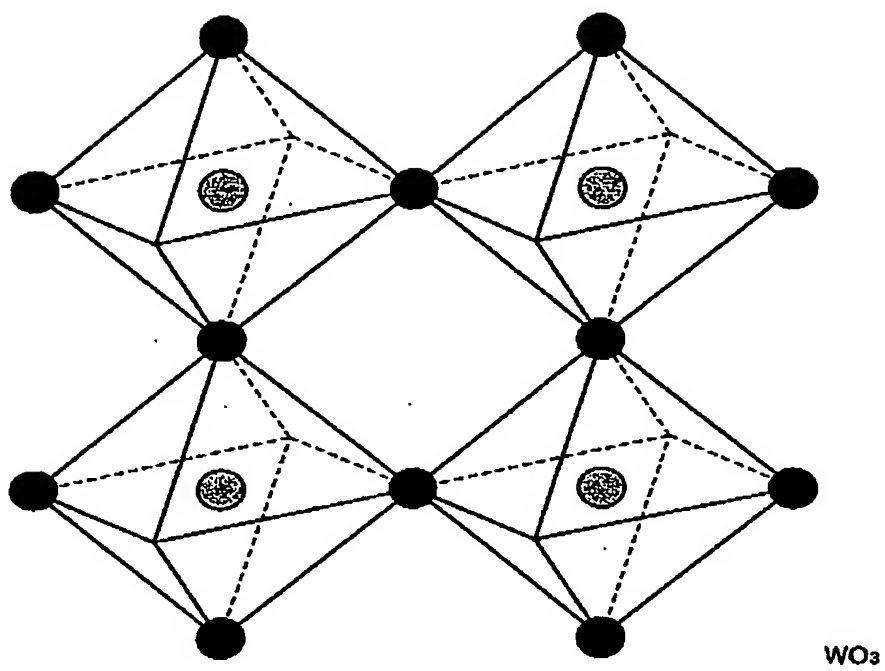


FIG. 23A

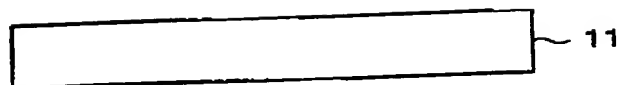


FIG. 23B

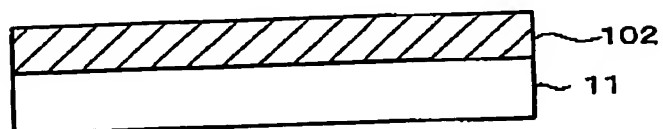


FIG. 23C

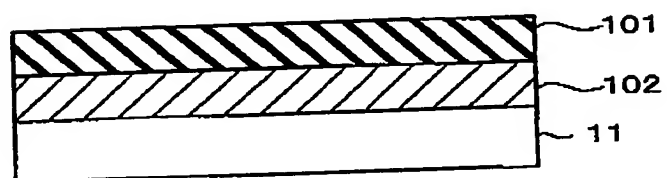


FIG. 24A

| | Nb添加量(mol%) | | | | |
|------------------|-------------|---------|---------|---------|---------|
| | 0 | 5 | 10 | 20 | 30 |
| a | 4.04 | 4.04 | 4.01 | 4.00 | 4.00 |
| c | 4.11 | 4.11 | 4.10 | 4.05 | 4.03 |
| V(abc) | 67.0818 | 67.0818 | 65.9284 | 64.8000 | 64.4800 |
| V/V ₀ | 100.0 | 100.0 | 98.3 | 96.6 | 96.1 |

FIG. 24B

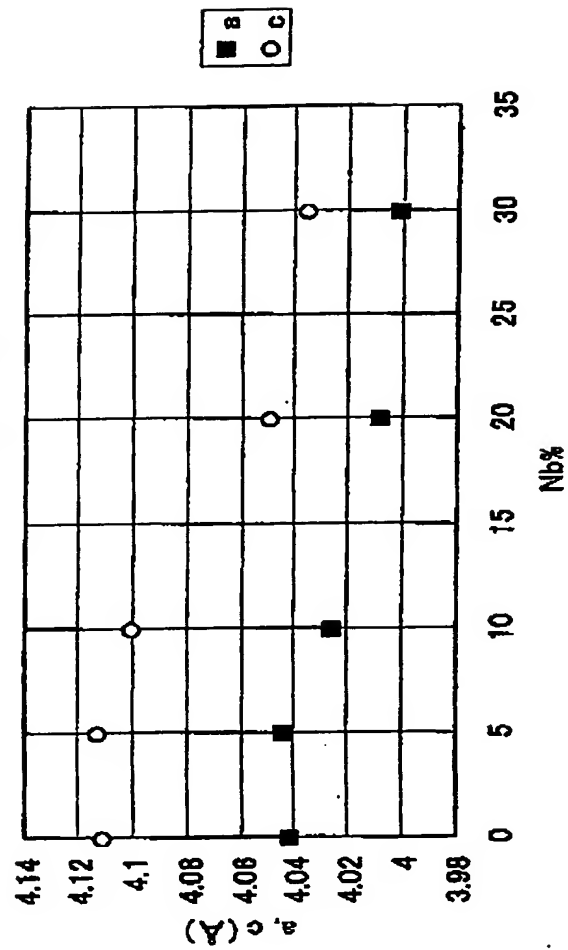


FIG. 25

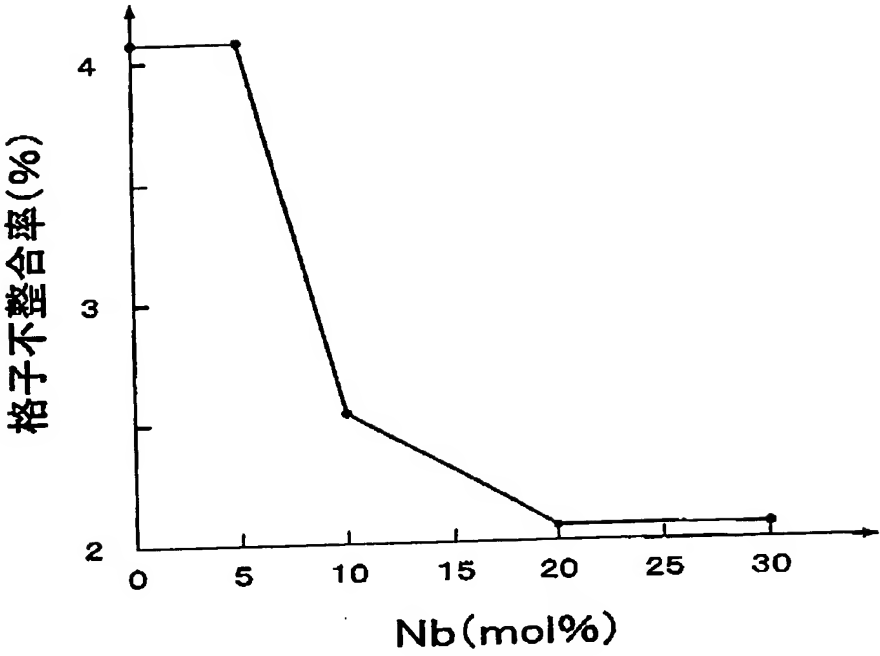
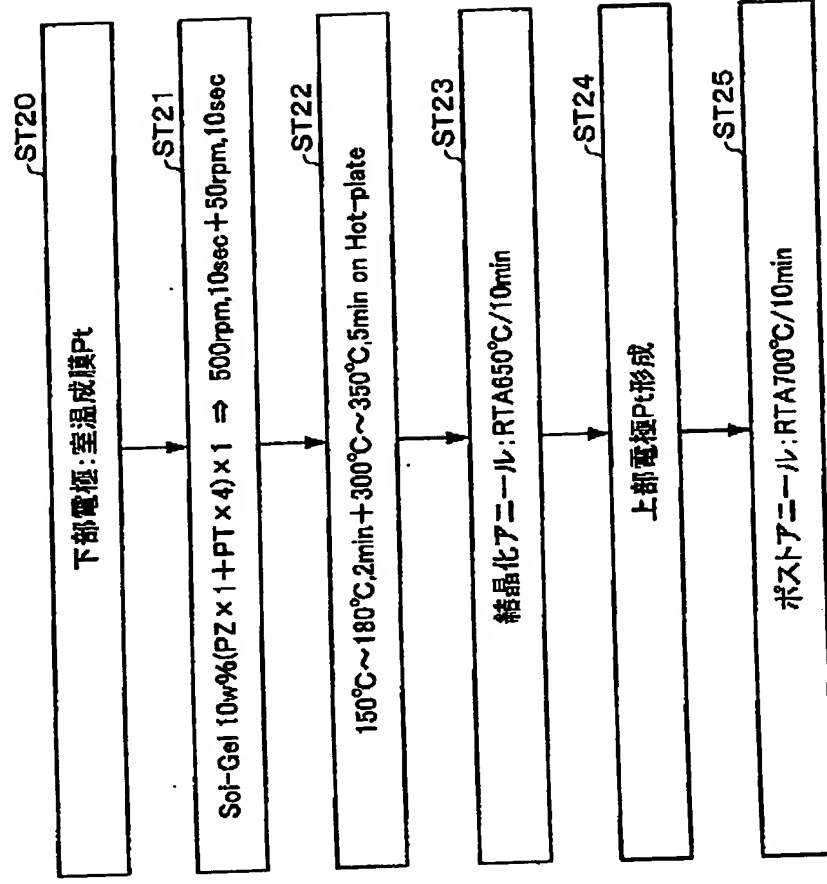
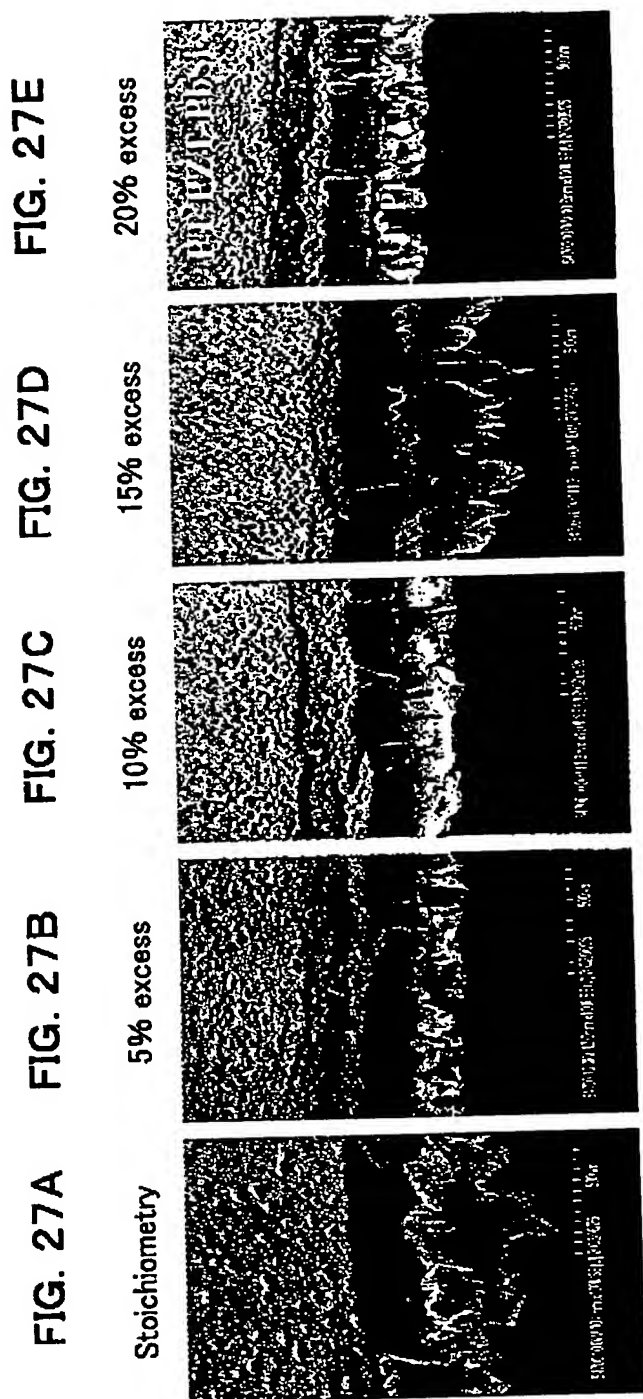


FIG. 26





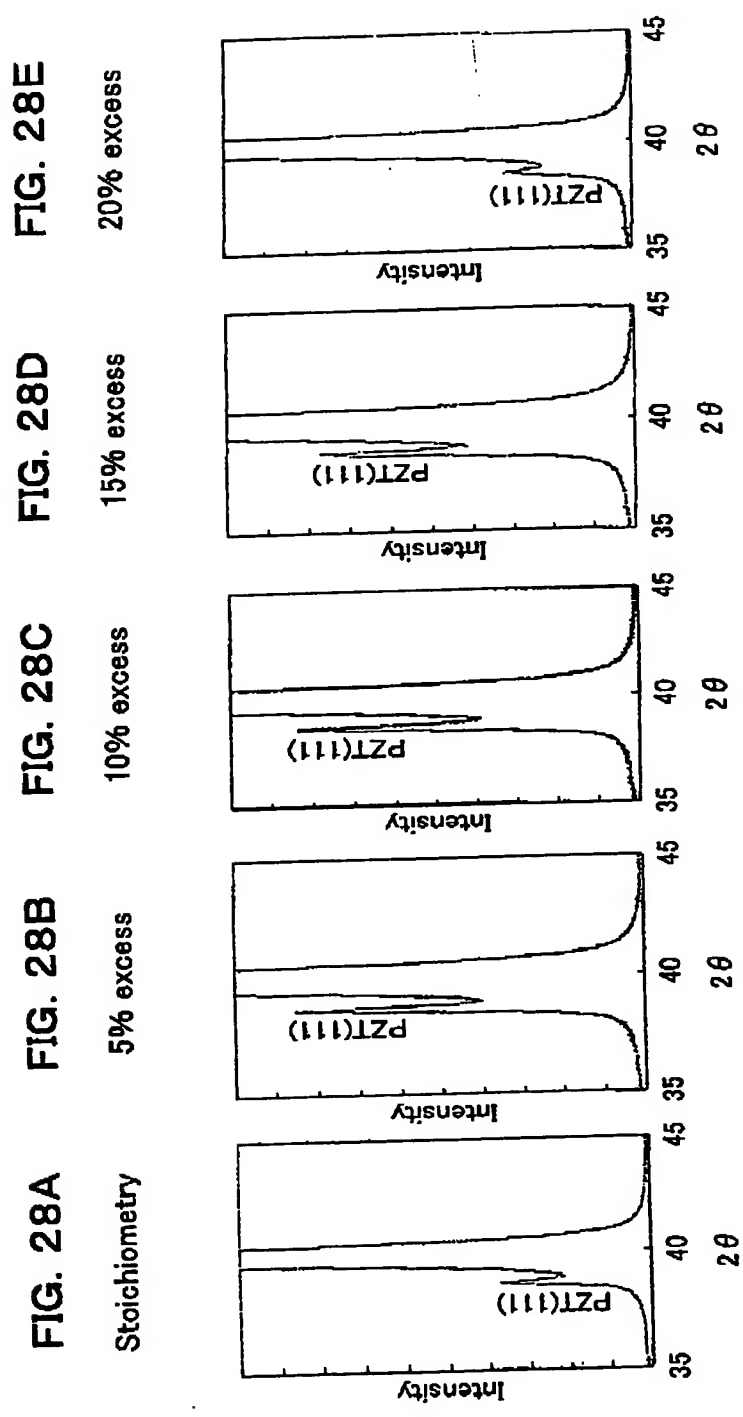


FIG. 29A

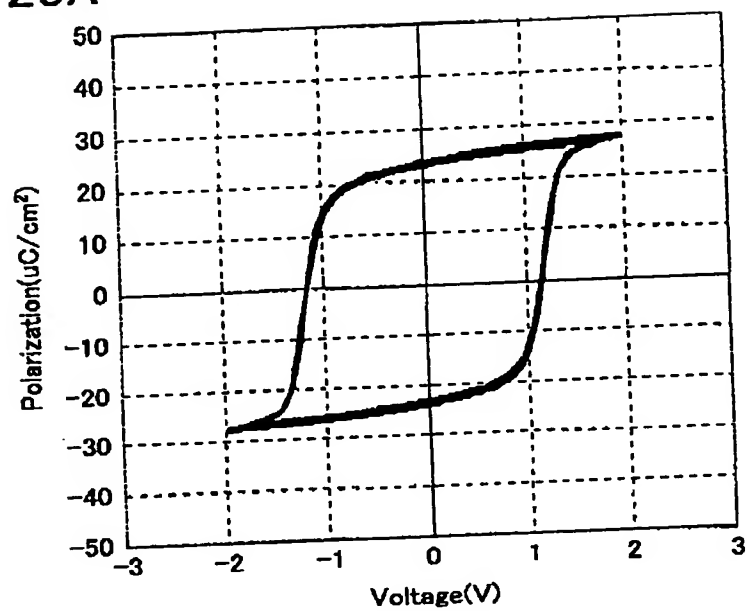


FIG. 29B

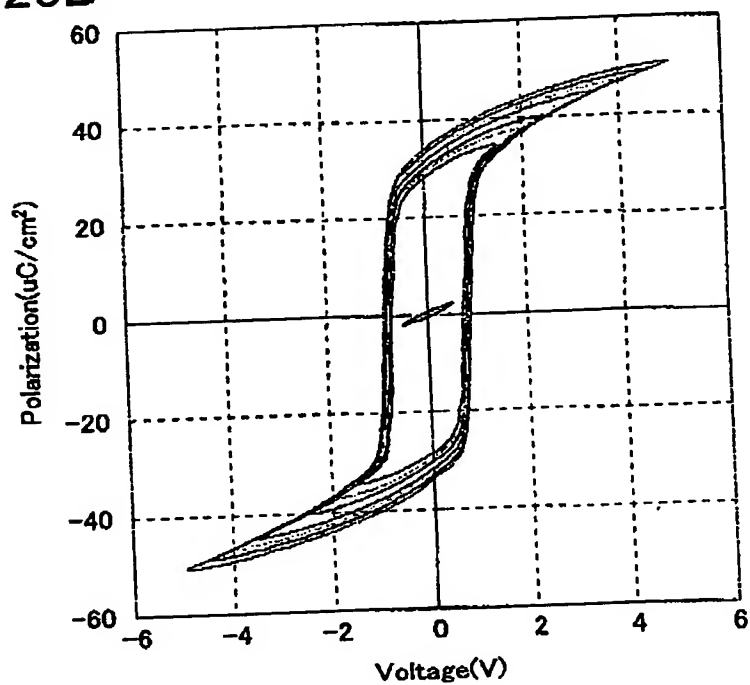


FIG. 30

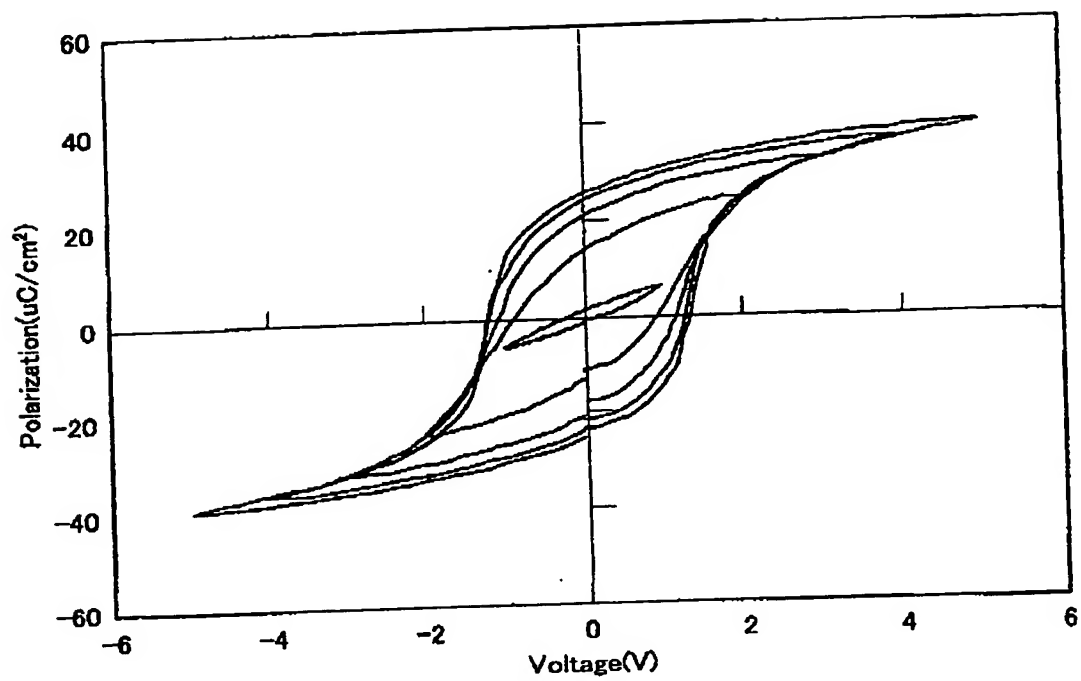


FIG. 31A

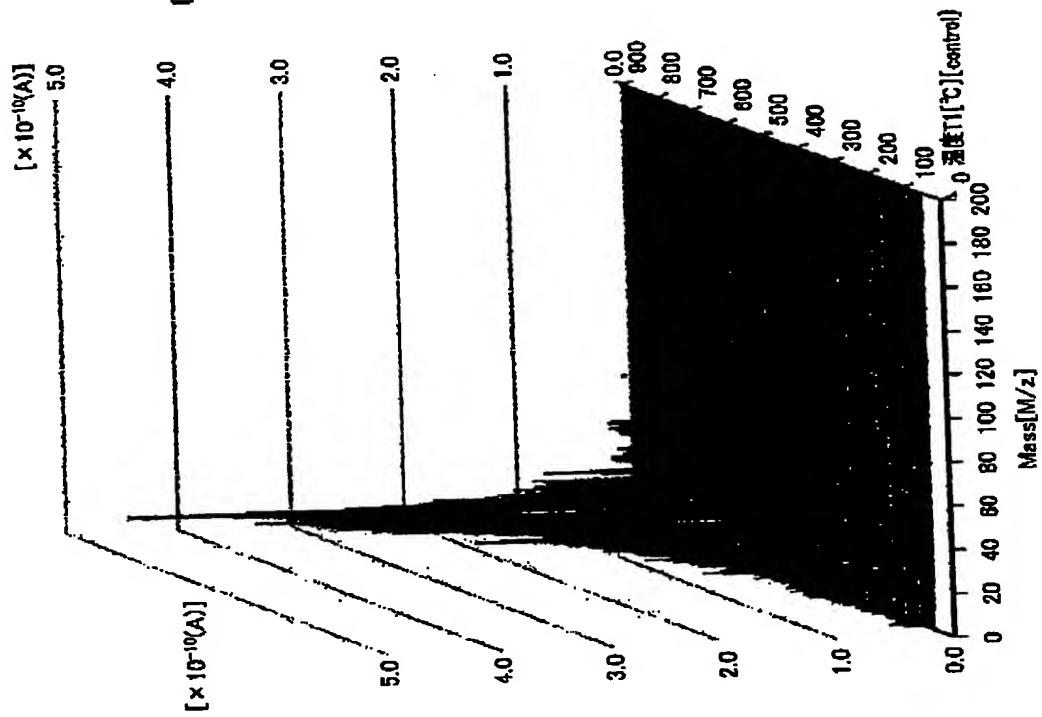


FIG. 31B

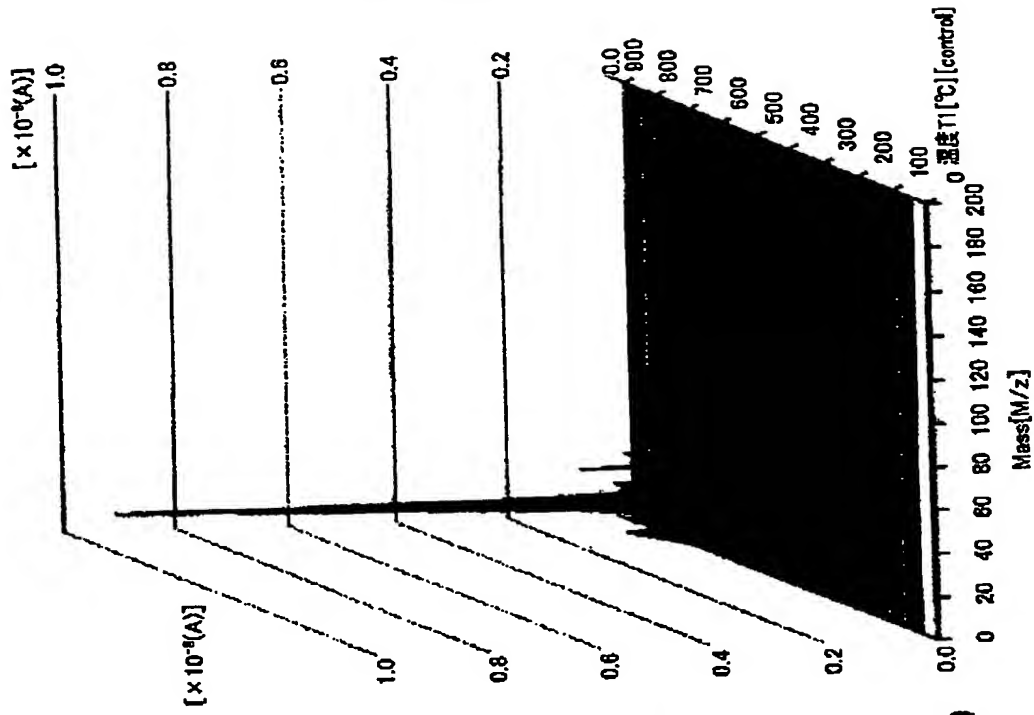


FIG. 32A

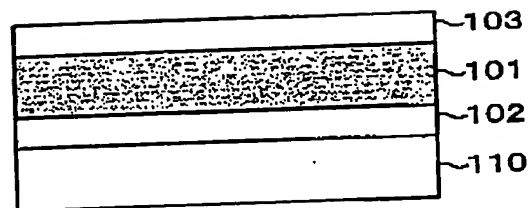


FIG. 32B

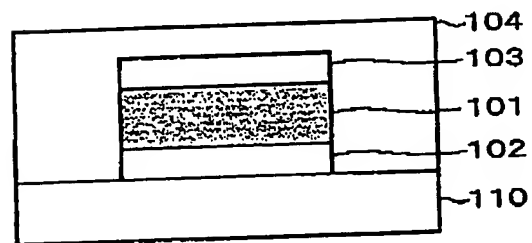


FIG. 32C

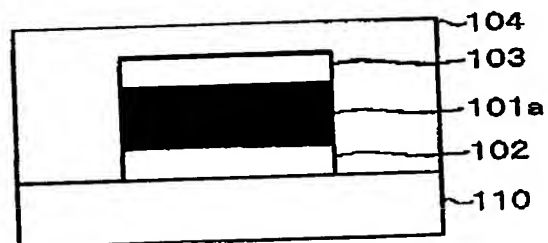


FIG. 33A

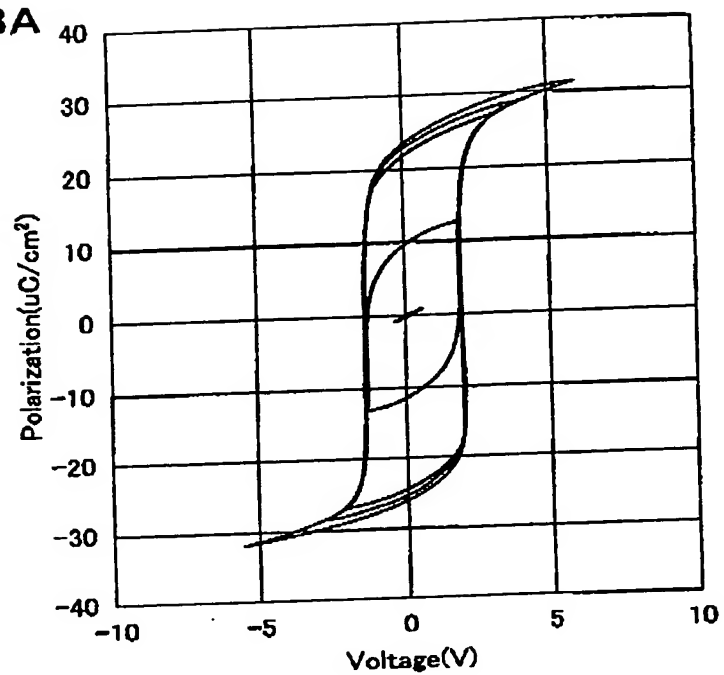


FIG. 33B

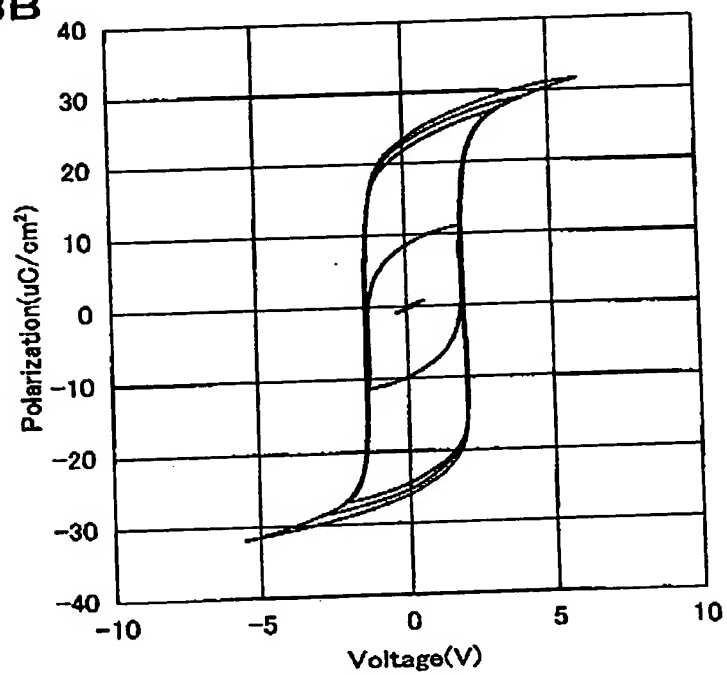


FIG. 34

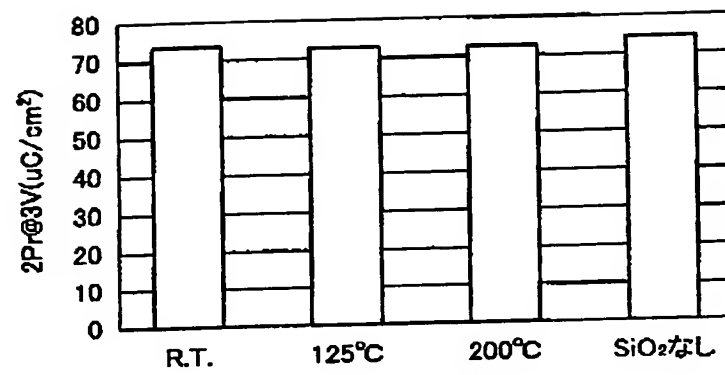


FIG. 35A

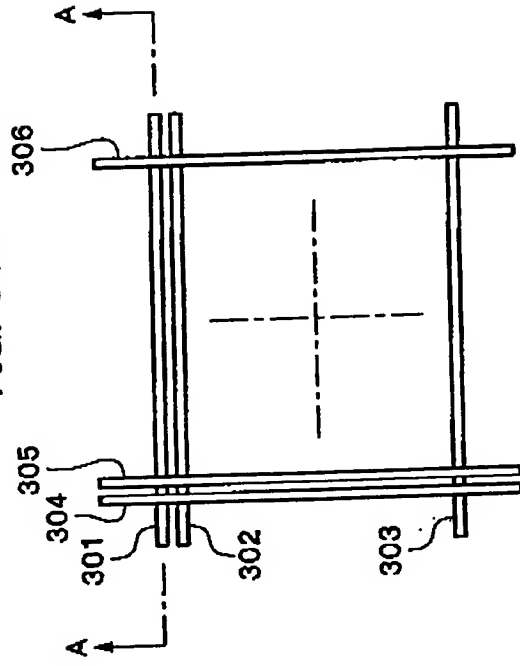


FIG. 35B

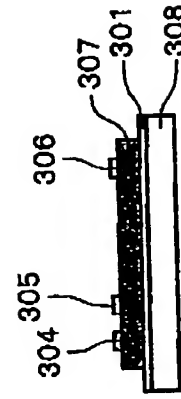


FIG. 36

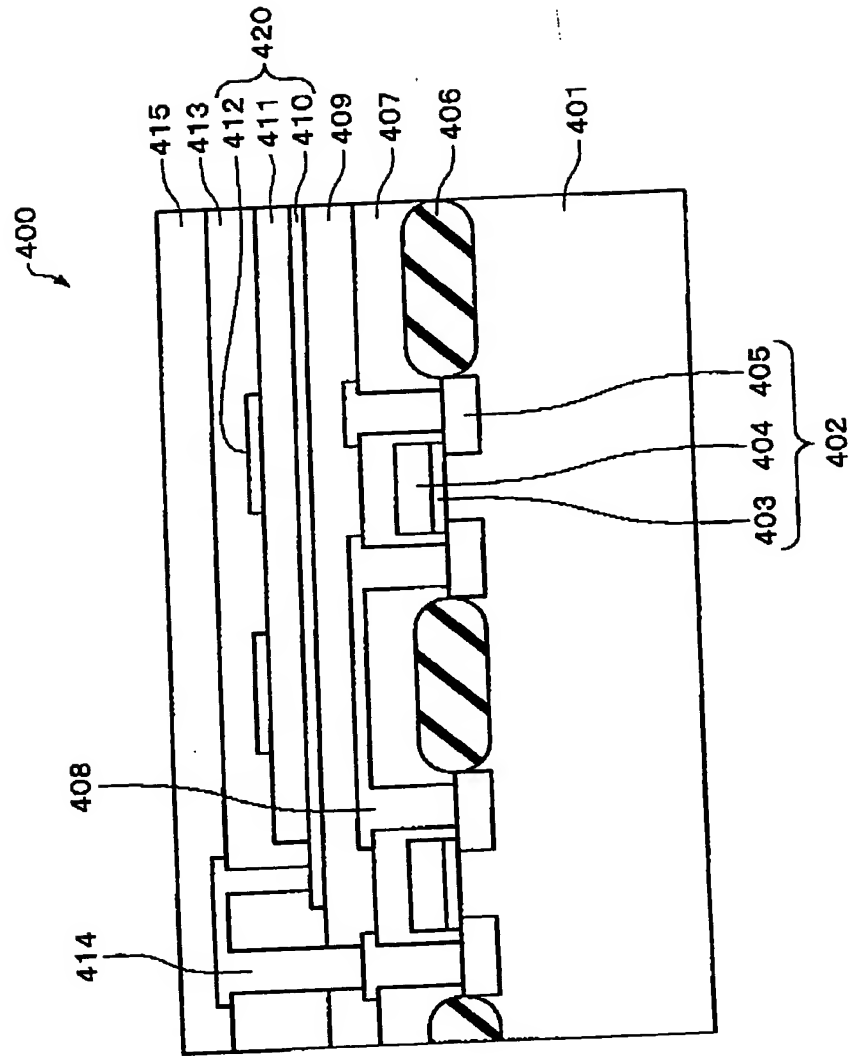


FIG. 37A

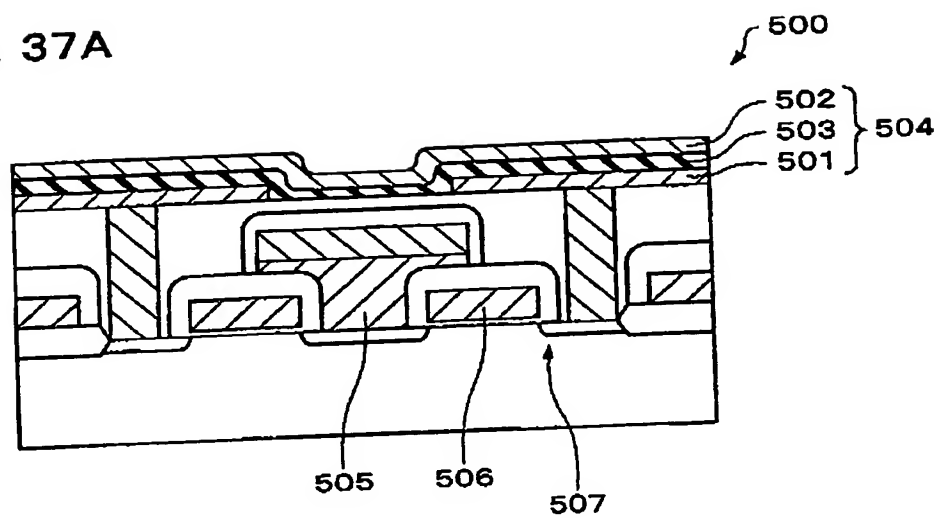


FIG. 37B

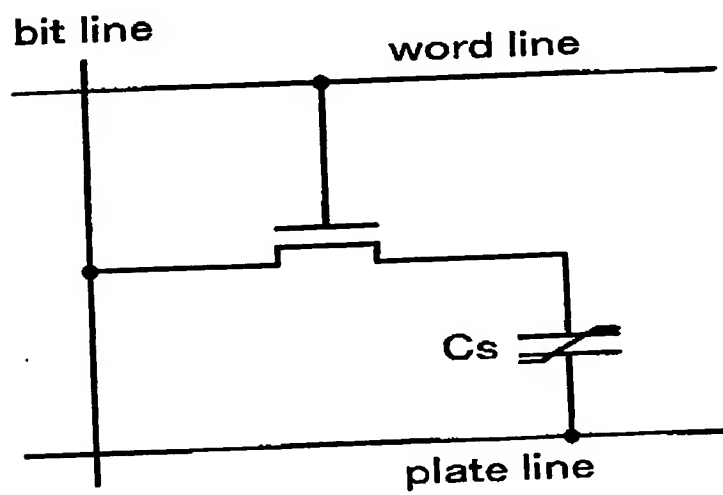


FIG. 38A

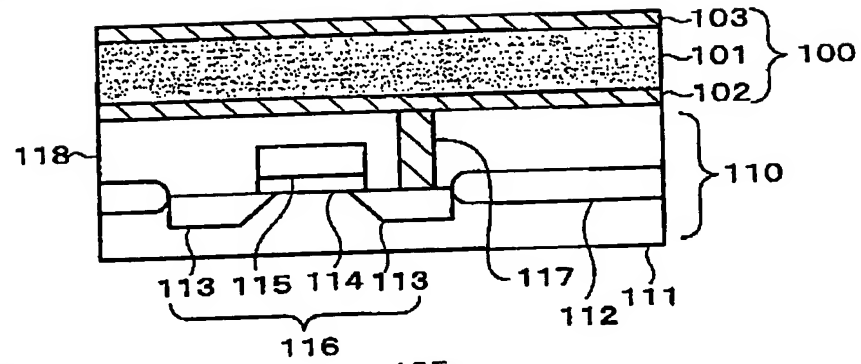


FIG. 38B

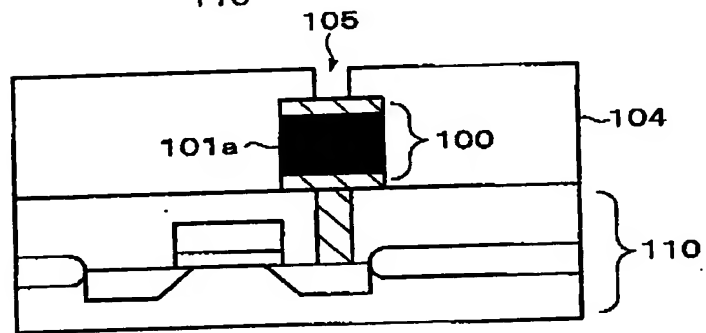


FIG. 38C

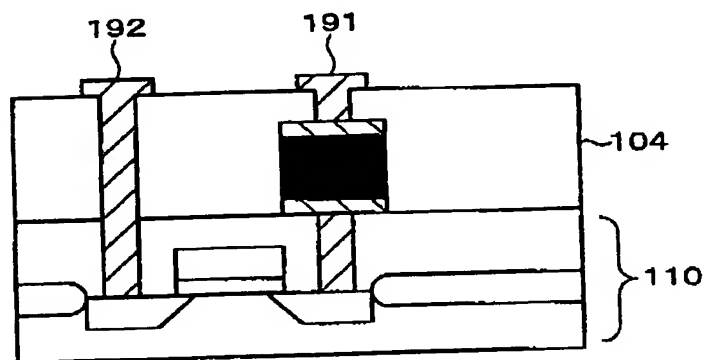


FIG. 39

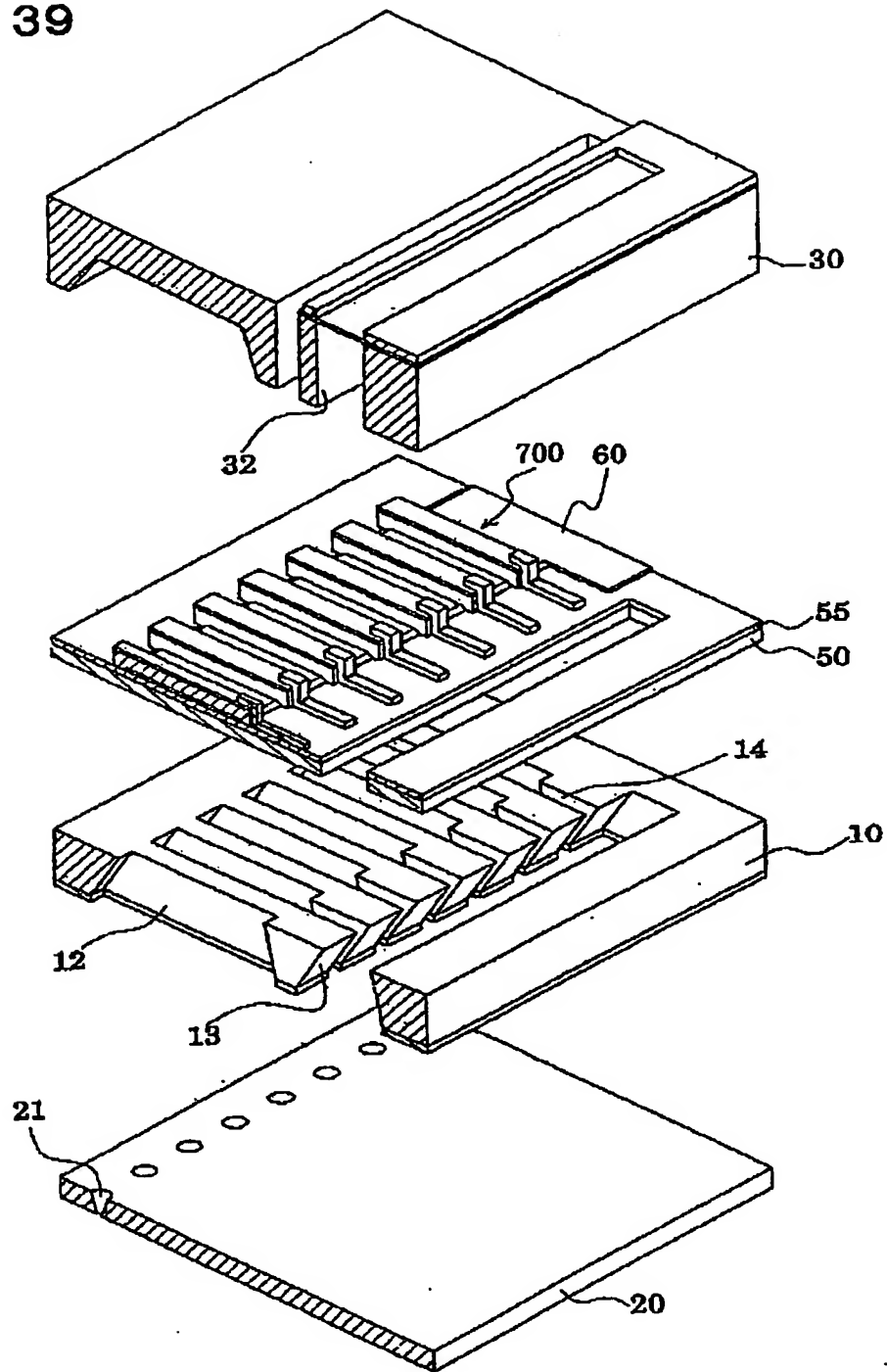


FIG. 40A

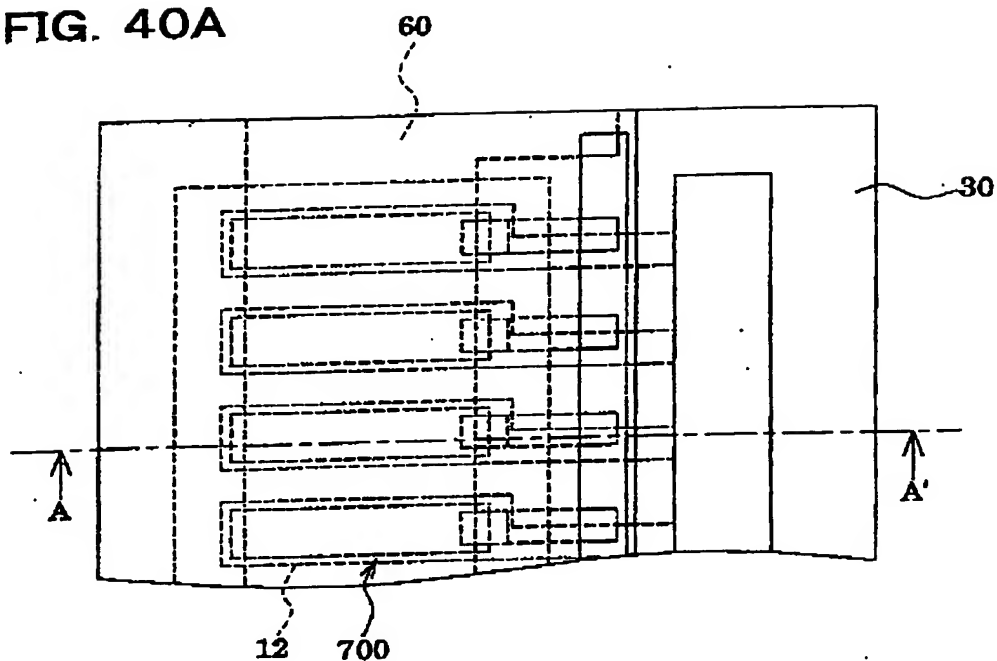


FIG. 40B

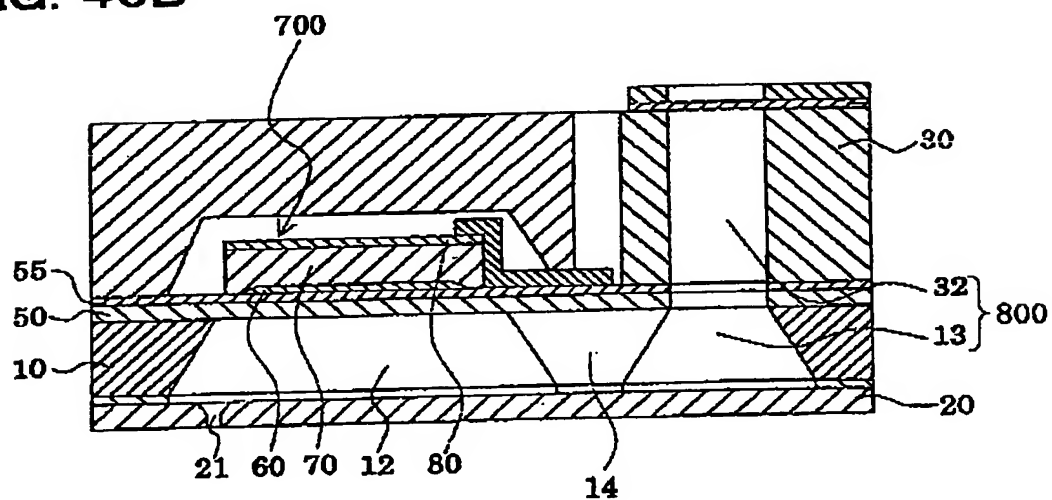


FIG. 41

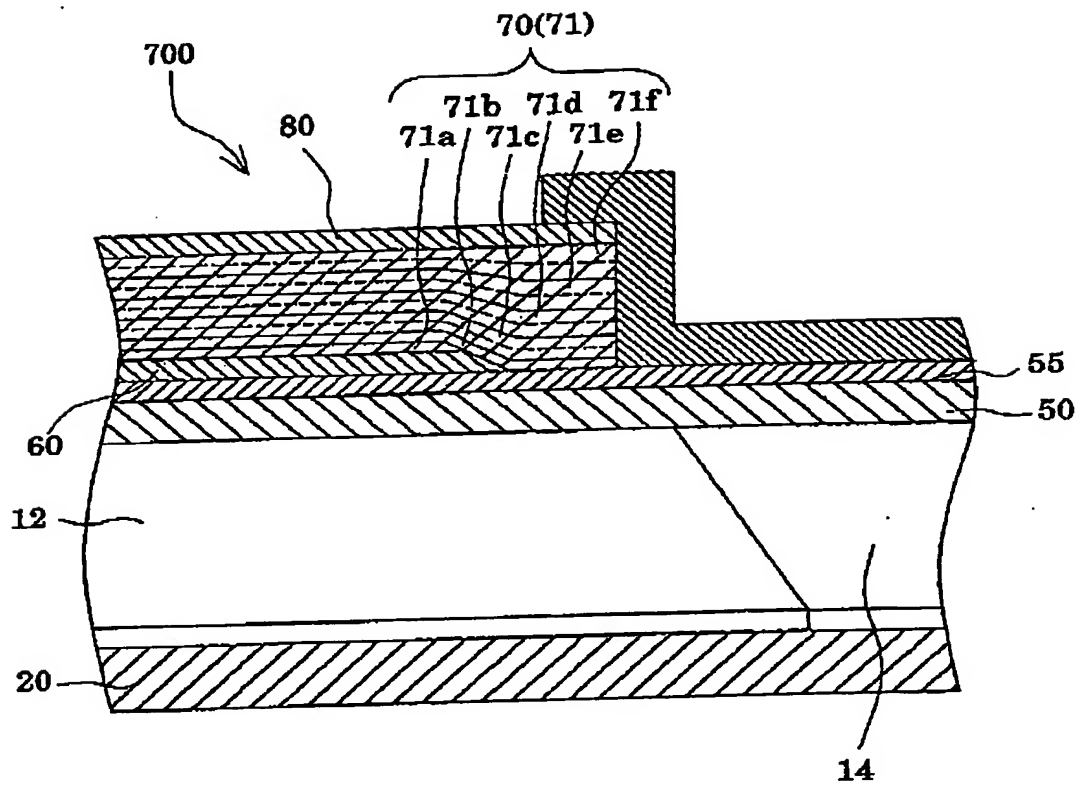


FIG. 43A

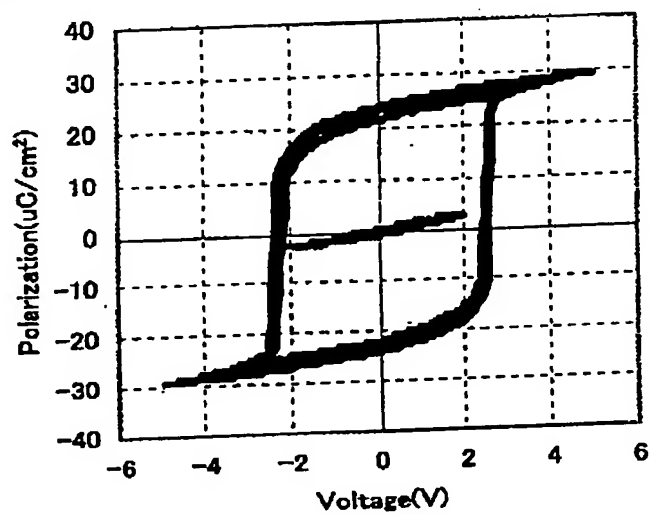


FIG. 43B

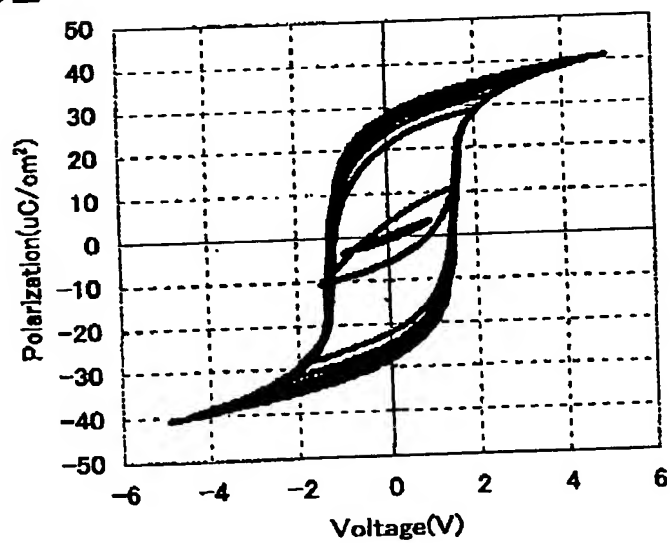


FIG. 44

| 元素 | 原子量 | 価数 (イオン半径(Å)) | 原子半径 (Å) | 結合エネルギー(M-O) (kcal/mol) | | イオン化エネルギー (eV) | |
|----|--------|------------------------|-------------|----------------------------|--|-------------------|--|
| | | | | | | | |
| Pb | 207.2 | +2(1.08), +4(0.78) | 1.33 | 38.8 | | 7.416 | |
| Zr | 91.224 | +4(0.72) | 1.6 | | | 6.84 | |
| Ti | 47.88 | +2(0.86), +3, +4(0.61) | 1.47 | 73 | | 6.82 | |
| Nb | 92.906 | +3, +4, +5(0.64) | 1.47 | | | 6.88 | |
| O | 54.36 | -1, -2(1.4) | | | | 13.618 | |

FIG. 45A

ブラウンミラライト構造 (ABO_{2.5})

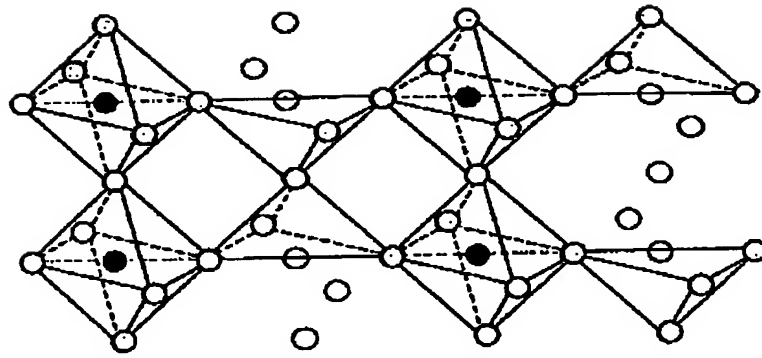
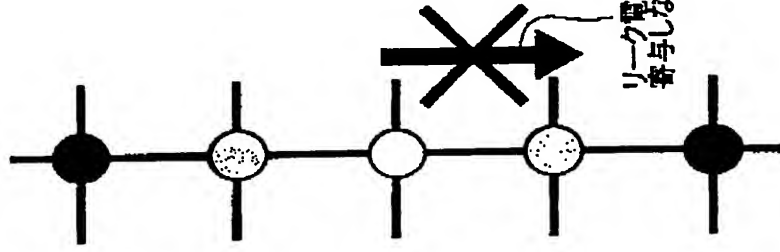


FIG. 45B

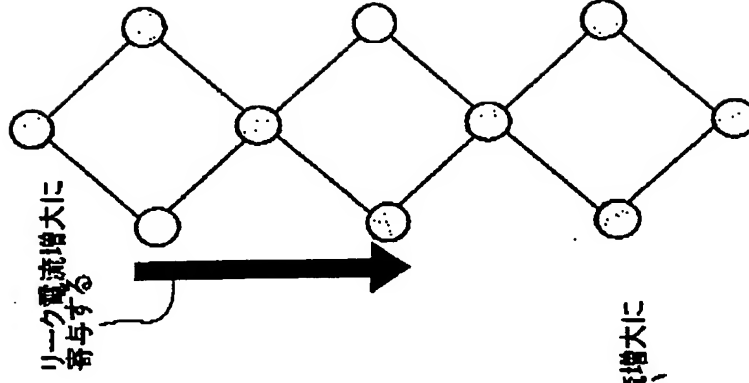
陽イオン欠陥



リーク電流増大に
寄与しない

FIG. 45C

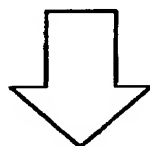
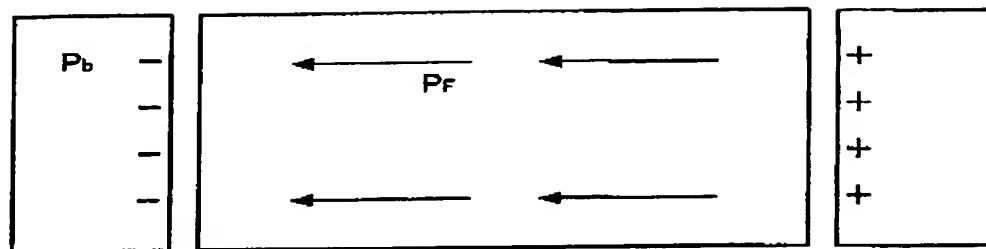
陰イオン欠陥



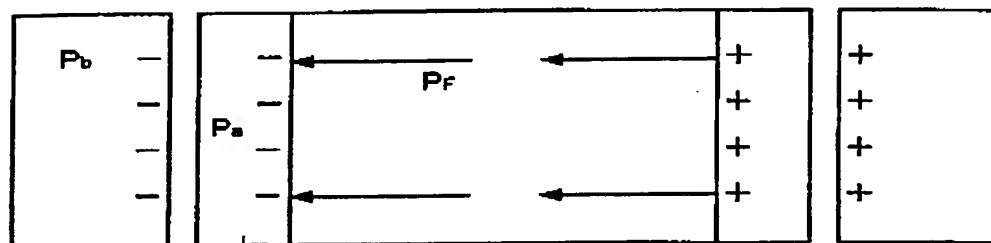
リーク電流増大に
寄与する

FIG. 46

分極



T_c 以下で放置



P_F を打ち消す方向に P_a が働く